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METHOD AND APPARATUS FOR COUPLING SOFT TISSUE TO A BONE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part application of U.S. patent application Ser. No. 12/474,802, filed on May 29, 2009, now U.S. Pat. No. 8,088,130 which is a continuation-in-part of (1.) U.S. patent application Ser. No. 11/541,506 filed on Sep. 29, 2006, now U.S. Pat. No. 7,601,165 issued on Oct. 13, 2009; (2.) U.S. patent application Ser. No. 11/541,505 filed on Sep. 29, 2006, now U.S. Pat. No. 7,658,751 issued on Feb. 9, 2010; (3.) U.S. patent application Ser. No. 12/014,399 filed on Jan. 15, 2008, now U.S. Pat. No. 7,909,851 issued on Mar. 22, 2011; (4.) U.S. patent application Ser. No. 12/014,340 filed on Jan. 15, 2008, now U.S. Pat. No. 7,905,904 issued on Mar. 15, 2011; (5.) U.S. patent application Ser. No. 11/935,681 filed on Nov. 6, 2007, now U.S. Pat. No. 7,905,903 issued on Mar. 15, 2011; (6.) U.S. patent application Ser. No. 11/869,440 filed on Oct. 9, 2007, now U.S. Pat. No. 7,857,830 issued on Dec. 28, 2010; (7.) U.S. patent application Ser. No. 11/784,821 filed on Apr. 10, 2007; (8.) U.S. patent application Ser. No. 11/347,661 filed on Feb. 3, 2006, now U.S. Pat. No. 7,749,250 issued on Jul. 6, 2010; and (9.) U.S. patent application Ser. No. 11/347,662 filed on Feb. 3, 2006, now abandoned.

This application is also a continuation-in-part of (1.) U.S. patent application Ser. No. 12/196,405 filed on Aug. 22, 2008 now U.S. Pat. No. 8,128,658; (2.) U.S. patent application Ser. No. 12/196,407, filed on Aug. 22, 2008 now U.S. Pat. No. 8,137,382; (3.) U.S. patent application Ser. No. 12/196,410, filed on Aug. 22, 2008 now U.S. Pat. No. 8,118,836; and (4.) U.S. patent application Ser. No. 13/071,563, filed on Mar. 25, 2011. The disclosures of the above applications are incorporated herein by reference.

FIELD

The present disclosure relates to method of coupling soft tissue and, more particularly, to a method of coupling soft tissue to a bone.

BACKGROUND

The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

It is commonplace in arthroscopic procedures to employ sutures and anchors to secure soft tissues to bone. Despite their widespread use, several improvements in the use of sutures and suture anchors may be made. For example, the procedure of tying knots may be very time consuming, thereby increasing the cost of the procedure and limiting the capacity of the surgeon. Furthermore, the strength of the repair may be limited by the strength of the knot. This latter drawback may be of particular significance if the knot is tied improperly as the strength of the knot in such situations may be significantly lower than the tensile strength of the suture material.

To improve on these uses, sutures having a single pre-formed loop have been provided. FIG. 1 represents a prior art suture construction. As shown, one end of the suture is passed through a passage defined in the suture itself. The application of tension to the ends of the suture pulls a portion of the suture through the passage, causing a loop formed in the suture to

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close. Relaxation of the system, however may allow a portion of the suture to translate back through the passage, thus relieving the desired tension.

It is an object of the present teachings to provide an alternative device for anchoring sutures to bone and soft tissue. The device, which is relatively simple in design and structure, is highly effective for its intended purpose.

SUMMARY

To overcome the aforementioned deficiencies, a method for attaching a fixation device to a bone is disclosed. The method includes bringing a bone cutting tool that extends along a longitudinal axis into engagement with an outer surface of the bone. The bone cutting tool is then rotated about the longitudinal axis while driving the bone cutting tool from the outer surface of the bone to a predetermined depth in the bone to form a bore. The bone cutting tool is continuously rotated at the predetermined depth to establish an enlarged bone pocket at a distal end of the bore. The bone pocket defines a shoulder extending around a circumference between the bone pocket and the bore. The bone cutting tool is next removed from the bone pocket and the bore and the fixation device is inserted into the bone pocket through the bore. The fixation device is now positioned against the shoulder of the bone pocket.

A method of attaching a fixation device to a bone is also disclosed. A bone cutting tool having a helical flute is brought into engagement with an outer surface of the bone. The bone cutting tool is rotated about a longitudinal axis to form a first bore having a helical flute groove extending from the outer surface of the bone to a depth within the bone. The bone cutting tool is continuously rotated at the depth to establish a second bore having a shoulder and a continuous sidewall. The shoulder extends around a circumference between the second bore and the first bore. The bone cutting tool is aligned with the first bore. The bone cutting tool is drawn out of the second and first bores. The fixation device is inserted into the second bore through the first bore. The fixation device is then positioned against the shoulder of the second bore.

In another embodiment, a method of attaching a fixation device to a bone is disclosed. A bone cutting tool is rotated through a cortical bone about a longitudinal axis of the tool to a predetermined depth in the cancellous bone to form a bore. The bone cutting tool includes a body portion, a first member, and a second member. The body portion extends from a proximal end to a distal end along the longitudinal axis. The first member extends radially outwardly from the distal end of the body portion. The first member has a first diameter defined by at least one transverse cutting flute. The second member extends radially outwardly from the body portion proximal the first member and has a second diameter greater than the first diameter. The bone cutting tool is continuously rotated at the predetermined depth to establish an enlarged bone pocket at a distal end of the bore. The bone pocket defines a shoulder extending around a circumference between the bone pocket and the bore.

Further areas of applicability will become apparent from the description provided herein. It should be understood that the description and specific examples are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

DRAWINGS

The drawings described herein are for illustration purposes only and are not intended to limit the scope of the present disclosure in any way.